

REMARKS

1. TITLE

Applicant has amended the title by introducing the word "whole" in order to specify that the material to be evaluated is a "whole" printing medium.

2. PENDING CLAIMS

Applicant has amended claims 1-40 and has added claims 41-49. Claims 1-49 are now pending in the application.

Former claims 1-40 were amended by specifying that the material that is to be evaluated is a "whole" printing medium. Support for these amendments may be found throughout the description; see, for example, paragraphs 15-18 and 27-32.

Applicant has further amended many of the originally pending claims by modifying their phrasing and in some instances their punctuation in order to make them easier to read. To prevent possible confusion, these amendments involved the removal of the words "set of" when referring to the generation of spectral data for an unknown sample of whole printing medium and using these words only to refer to the spectral data generated for reference whole printing media.

For better clarity, dependent claims 16 and 36 were amended by adding the words "by reference" immediately after the word "criteria" in the phrase "defining tolerance criteria to

deviations between the produced set of FT-IR data and the reference set of FT-IR data".

Finally, applicant has added claims 41-47 to include claims that are specific to whole printing ink, jet ink and dyes. Support for these claims may be found throughout the description, and specifically at paragraph 15. Claims 48 and 49 were added because of the amendments to original claims 19 and 37. These two claims were originally drafted with an "and/or" component. To prevent confusion, the disjunction "or" was kept in claims 19 and 37, and the conjunction "and" introduced in new claims 48 and 49 which correspond, respectively, to claims 19 and 37.

Applicant submits that these claim amendments should serve to better distinguish the invention of the present application from the cited art, as discussed more particularly below. It is believed that no new subject matter has been introduced as a result of these amendments.

3. REJECTION OF CLAIMS 1-40 UNDER 35 U.S.C. 103(a)

The Examiner has rejected claims 1-40 under 35 U.S.C. 103(a) as being unpatentable over Descales et al (US Patent No. 6,070,128, hereinafter the "Descales patent").

Applicant respectfully submits that while at first glance the method described in the Descales patent would appear to be very similar to that taught in the present application, the Descales patent is different in material ways and would not assist a person of skill in the art in determining the quality of

a whole printing medium. These differences will now be considered in greater detail.

Applicant submits that the Descales patent is another example of a prior art reference that is generally of the spectrophotometric type. As stated at paragraph 6 of the description of the present application, "none of the [prior art] techniques provide (*sic*) an appropriate means for evaluating features and quality of a **whole printing ink**, and especially with regard to in-process performance." (Emphasis added.) As stated further in this paragraph, what the prior art references do, and the Descales patent is no different in this sense, is "teach that infrared (IR) and near infrared (NIR) spectrometry enable extended characterization of ink, providing some sort of distinctive signature (also referred to as fingerprint). Such techniques also proved to be very effective for chemometric analysis of organic components such as resins, pigments or solvents found in media such as paints, dyes and inks, as well as for quality control in the pharmaceutical industry."

Unfortunately, as stated at paragraph 8 of the present application, none of the prior art methods "is readily applicable to the evaluation of a **whole printing ink to reliably predict the in-process functional characteristics thereof and identify any features susceptible to negatively affect the performance of the ink(s) in a printing process such as offset, gravure, flexography, etc.**" (Emphasis added.) The invention that is described in the present application seeks to overcome the limitations of the prior art methods, and advantageously, as stated at paragraph 9, is able to achieve this with a very small

sample "to provide an indication of the degree of compliance with reference ink data and predict in-process performance characteristics prior to introduction of the ink into the actual process".

A key feature of the invention of the present application therefore is the ability to predict the soundness or quality of the functional characteristics of, for example, a whole ink sample *based on a collection of properties* as opposed to a single property or a few select properties. As stated at paragraph 17 of the present application, "complete, accurate, repeatable and distinctive signatures can be obtained by submitting whole printing ink samples to Fourier Transform - InfraRed (FT-IR) interferometric analysis according to a test set-up of the type as illustrated in Figure 1, representing a typical interferometer system 17. In the same manner, complete, accurate, repeatable and distinctive signatures could be obtained by submitting whole printing ink samples to Fourier Transform - Near-Infrared (FT-NIR) interferometric analysis according to the test set-up of Figure 1."

In contrast to this, the Descales patent describes "a method of determining or predicting a value P_x which is a value of a property of a material X or a property of a product of a process from said material or yield of said process". (Emphasis added; see claim 1, for example.) As illustrated in Figure 2 of the Descales patent, the method of this prior art references relies on measuring the absorption of a sample compound or composition at a number of different wavelengths and comparing the resulting absorptions to those of known compounds or compositions which

have the most similar infrared spectral data. This is a key aspect of the Descales patent, which is discussed, for example, in the following passage taken from Example 1: "from the properties of the standard samples, octane numbers (RON and MON), vapour pressure (hpa) volatility, percentage distilled at 70°C and at 100°C, gum content (in mg/ml), and content of sulphur, benzene (vol%) and MTBE were calculated for the superfuel by taking the arithmetic mean of the values for the 3 chosen standards" and "the estimated results are compared with the measured results". In other words, the analysis provides fairly accurate, "microscopic" results.

This stands in contrast to the results provided by the method of the present invention, which may be said to be more "macroscopic" in scope. Significantly, the present invention does not depend on the similarity of spectral results between an unknown sample and reference samples. Instead, spectral data and information related to the physical characteristics of an unknown sample of a whole printing medium are generated and processed mathematically (i.e., through the use of an algorithm) and the results are compared with analogous information previously generated for known samples of whole printing media which have been stored in a database. The unknown sample is thereby compared to all of the known samples in the database, and not to a specific reference sample.

In operation, the invention may rely on the establishment of "tolerance criteria". As described at paragraph 30 of the application, the tolerance criteria are determined in the following manner:

"Definition of the tolerance criteria is the result of extensive experimentation. Sets of FT-IR (and eventually FT-NIR) spectral data from numerous whole printing ink supplies of slightly different chemical compositions were obtained (step 801), followed by testing physical and mechanical properties of these ink supplies and introduction of the ink supplies into a printing process to test their functional properties (step 802). Physical (for example tack, density, strength, viscosity, etc.), chemical (for example, resin, solvent, pigment, etc.), mechanical and functional (for example coverage, mileage, etc.) properties (features) of each ink supply were recorded (step 803) and correlated with the corresponding sets of spectral data. The latter correlations enabled prediction of the impact on ink features of deviations with respect to a reference accepted (master) batch with a sufficient level of confidence to accept or reject the whole printing ink supply. Tolerance criteria can therefore be defined from these correlations (step 805 of FIG. 8) to accept only whole printing ink supplies of adequate quality and performance."

In light of the above claim amendments and remarks, favorable reconsideration of the present application is requested. If the Examiner finds that this case is not now in condition for allowance and believes that an interview would be helpful in resolving questions, Applicant requests that the Examiner contact its representative at the telephone number listed below to arrange a telephonic or personal interview.

Respectfully submitted,

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